

VIII.—*The Birds of Spitsbergen and Bear Island* \*. By the Rev. F. C. R. JOURDAIN, M.A., M.B.O.U., C.F.A.O.U.

THE literature of the Spitsbergen group has been so exhaustively dealt with by Prof. A. Koenig and the late Dr. O. Le Roi in 'Avifauna Spitzbergensis,' that it seems unnecessary to reprint the long list of papers on the ornithology of the group, which is practically complete up to 1911. Some addenda will, however, be found in a paper by H. Schalow in the *J. f. O.* 1912, pp. 621-630.

By far the most important work on the ornithology of Spitsbergen is that of Koenig and Le Roi, in which the foreign literature (ignored by English writers on the subject almost entirely) is carefully collated. This fine work must always remain the foundation of all future research on the subject. Of earlier writers on the subject, Friderich Martens (1675) gave a list of 17 species, of which 15 can be identified with certainty; C. J. Phipps ('A Voyage towards the North Pole, etc.' 1774) records 12 species; J. C. Ross (Appendix to W. E. Parry's 'Narrative of an attempt to reach the North Pole,' 1828) mentions 21 forms, of which 17 are probably correct; and O. Torell ('Bidrag till Spitsbergens Molluskfauna,' 1859) includes a list of 30 species, of which 22 are reliable. Malmgren ('Anteckningar till Spetsbergens Fogel-Fauna,' 1863) records 28 species, of which 3 are doubtful, and estimates the breeding species at 22. In his 'Nya anteckningar till Spetsbergens fogel-fauna,' 1864, the number of recorded species is raised to 27, and 15 species are recorded from Bear Island. The Rev. A. E. Eaton ('Zoologist,' 1873, pp. 3762-3772; and 1874, pp. 3805-3822) has some interesting notes on the fauna, and treats of 24 species. T. v. Heuglin ('Reisen nach den Nordpolarmeer in dem Jahren 1870 und 1871,' 1874) compiles a list of 32 species, 2 of which should be deleted, while Sundevall ('Spetsbergens Foglar, etc.,' 1874) estimates the

\* Contributions of the Oxford University Expedition to Spitsbergen. No. 1.

number at 29, one of which is very doubtful. A. H. Cocks ('Zoologist' 1882, pp. 321, 378, & 404) treats of 21 species observed by him, and in a later paper (*op. cit.* 1883, pp. 393, 433, 479; 1884, p. 13) raises the number to 33, of which, however, 4 rest on uncertain evidence (*cf.* also *op. cit.* 1884, p. 231; and A. Chapman, Nat. Hist. Trans. Northumberland, viii. p. 138). A. Pike contributed notes on "A Winter in the 80th Degree," to Chapman's 'Wild Norway' (1897), and A. Trevor Battye (*Ibis*, 1897, pp. 574-600) a paper on "The Birds of Spitsbergen as at present determined"; but only 29 species are recorded, of which only 24 were met with by his party. F. Römer and F. Schaudinn's 'Fauna Arctica,' 1900 (*cf.* also *Orn. Monatsber.* 1900, pp. 100, 116, 136, 153, & 165), and a very useful paper by G. Swenander, "Beiträge zur Fauna der Bären-Insel, I." (1900), in which 22 species are recorded, as well as G. Kolt-hoff's valuable 'Bidrag till Kaennedom om norra Polartrak-ternas Däggdjur och Fåglar' (1903) should also be consulted. Graf Zedlitz has also published some notes in the *J. f. O.* 1911, pp. 300-327, on birds observed in Norway and Spits-bergen.

The first party of the Oxford University Expedition left Tromsö on the night of 10 June, 1921, and reached Bear Island on 13 June. Here a party remained till 23 June, when the Expedition sailed for Spitsbergen, arriving at the mouth of Ice Fjord on the evening of 25 June. The west and north coast up to Liefde Bay and Moffen Island were then worked and a camp formed on Prince Charles Foreland (20 June-10 July). The exploring party arrived at Bruce City on 21 July, and on the 22nd the first party left Longyear City for Tromsö, which was reached on 26 July, the second party not returning till September. Dr. G. J. van Oordt, of Utrecht, who was staying at Cap Boheman in Ice Fjord at the time of our visit, has kindly contributed some notes, which are incorporated in this paper.

LIST OF SPECIES RECORDED FROM BEAR ISLAND AND  
SPITSBERGEN.

[*Corvus corax* L. Raven. One reported in summer 1874 by sailors of Mr. A. Campbell's party (Ibis, 1875, p. 272).]

1. *Corvus cornix* L. Hooded Crow.

Dr. Bunge saw a Hooded Crow on 16 May, 1900, at Goose Bay in Horn Sound. Tobiesen also reports two Crows on Bear Island on 30 March and 20 May, 1866. A Crow (sp.?) was also seen at Bell Sound by a member of Nathorst's Expedition.

2. *Corvus (frugilegus* L.?). Rook.

Dr. Bunge saw in Horn Sound a black *Corvus* on 16 and 17 May, 1900 (as well as *C. cornix*) which he supposed to be *C. corone*, but as Bianchi suggests, it was more probably *C. frugilegus*.

[Martens (1675) records Black Crows as seen in Spitsbergen, but whether this refers to straggling Ravens, Crows, or possibly Rooks is quite uncertain.]

3. *Sturnus vulgaris vulgaris* L. Starling.

Koenig's party discovered the remains of a Starling on the north coast of Bear Island (Herwig Harbour) on 14 July, 1907.

4. *Carduelis hornemanni* (Hollb.). Hornemann's Redpoll.

Scoresby in 1820 includes "*Fringilla linaria*" as met with at sea about 10 miles from land. Several were taken alive. In 1874, A. E. Eaton records one as alighting on the ship on 27 May, 1873, in lat. 75° 13' N. and another as shot in Wijde Bay, while the crew saw 5 or 6 others and found a nest with eggs, possibly of this species. No later records. The skin is in the Cambridge University Museum.

5. *Loxia curvirostra* L. Crossbill.

A small flock (perhaps a family party) met with on Bear Island on 25 July, 1868, and two specimens were obtained by Malmgren.

6. *Plectrophenax nivalis nivalis* (L.). Snow-Bunting.

Summer resident, very generally distributed and in some districts common. In Bear Island it is not numerous except in the boulder-strewn tracts. At the settlement of Longyear City, in Advent Bay, it is as common and familiar as the Sparrow at home, nesting in the houses. A favourite site is under a boulder or among piled up rocks, but nests may also be found in crevices of cliffs overhanging the sea. The clutch varies from 4 to 7 in number. Young on wing, 18 July.

7. *Anthus* sp.? Pipit.

A small Pipit came on board the 'Severine' off Bear Island in 1868, but was not secured. This was probably some form of Rock-Pipit (? *A. spinoletta littoralis*). Heuglin also saw a Pipit (?) on the cliffs of Stor Fjord. On 15 June, 1921, Dr. T. G. Longstaff met with a Pipit on the east side of Bear Island, and had a shot at it, but failed to obtain it. [H. L. Powell reported a bird with a Lark-like song seen high in the air at Walrus Harbour, Bear Island, on 14 June.]

8. *Ænanthe ænanthe leucorhoa* (Gmel.). Greenland Wheatear.

Four occurrences. One from Moffen Island in summer of 1891 recorded by Collett, and three obtained by Koenig's Expedition in 1908 at Van Keulen Bay (two, 14 June) and Horn Sound (25 June), which are ascribed to this race.

9. *Turdus musicus* L. Redwing.

Once recorded from Bear Island: remains of one picked up 13-14 July, 1907, on the north coast by Koenig's party. Two occurrences in Spitsbergen: one at Horn Sound found on 8 October, 1899 (Bianchi) and others said to have been seen. A dead bird was picked up by J. D. Brown on 13 July, 1921, near Cape Wijk, in Dickson Land.

10. *Turdus merula* L. Blackbird.

Remains of a female picked up 13-14 July, 1907, on the north coast of Bear Island (Koenig).



11. *Hirundo rustica* L. Swallow.

One seen in Coal Bay in summer 1874 by three members of the Campbell Expedition (Ibis, 1875, p. 272). Bianchi also records a Swallow as seen in Horn Sound, 29 May, 1900.

12. *Apus apus* (L.). Swift.

Collett records one in Tromsø Museum, obtained in August 1891 off the coast of Spitsbergen.

13. *Upupa epops epops* L. Hoopoe.

One obtained in August 1868, in lat. 76° 5' N., on a ship off south Spitsbergen, and now in Christiania Museum (Collett).

14. *Nyctea nyctea* (L.). Snowy Owl.

Probably a resident in small numbers. Le Roi mentions some 15 occurrences, chiefly in July and August, but also in March, October, and November. Apparently dependent on the Ptarmigan for food during the winter, and in consequence local. Not identified with certainty by the Oxford Expedition in 1921, but we had good evidence of its occurrence in 1920 both in Ebba Valley (Klaas Billen Bay) and Green Harbour.

15. *Falco rusticolus* (subsp. ?). Falcon.

Apparently only observed on a few occasions and no specimens obtained. One seen Wijde Bay, 4 June, 1863, and again at Treurenberg Bay a few days later (Malmgren). Also recorded from Ice Fjord in 1870; Van Keulen Bay, July 1881; Cap Thordsen, 12 September, 1882; Recherche Bay, 22 September, 1882; and probably on 22 September, 1899, in Horn Sound. There can be no doubt about the Cap Thordsen record, as the bird stooped at the Pigeons at the Swedish Meteorological Station. Not recorded from Bear Island.

16. *Cygnus* (sp.?). Swan.

No specimens extant and no recent records. A Swan (sp.?) was shot in Stor Fjord several years prior to 1861; others were reported as seen by sealers in Ice Fjord, and by Captain Kuylenstjerna in August 1861 in Advent Bay.

17. *Anser brachyrhynchus* Baill. Pink-footed Goose.

Passage migrant only on Bear Island. "Grey" Geese reported on passage by Lerner, 28 May, 1899, and single birds by Swenander in July 1899; Le Roi, 20 June, 1907; and on 15 June, 1921, by two members of the Oxford Expedition. Fresh droppings also noted. In Spitsbergen it is a widely-distributed summer resident, and breeds in many places on the west and north-west coasts as well as in Ice Fjord, and has been met with in Barents Land, Edge Land, and King Charles Land. The nesting-sites vary considerably; many birds breed on ledges or grassy slopes on the face of cliffs by the sea; others on great expanses of shingle in open valleys, or on slightly raised terraces in almost flat swampy valleys several miles inland. Clutches found varied from 2 to 4 in number, but Le Roi records 5, 7, and in one case 9, but evidently by two females. Moulded primaries were picked up on 7 July in Liefde Bay, and specimens shot on 17 July were incapable of flight.

18. *Branta bernicla bernicla* (L.). Brent Goose.

Although it probably occurs annually at Bear Island on passage, there seems to be no definite record of this species beyond Kolthoff's statement that he met remains (? droppings) north of Elend-Berg (Mount Misery); but on the evening of 14 June, 1921, three birds flew inland from the sea at Walrus Harbour. In Spitsbergen though many of the large colonies on islands have been so systematically raided by egg and down collectors, that the birds have been driven away almost entirely, it is still present in some numbers, and breeds chiefly on islands and rocky points, but also at times inland by banks of streams. It appears to be more widely distributed round the coast than *A. brachyrhynchus*, and breeds not only on the west side and in Ice Fjord, but also along the north coast and its outlying islands and at several places on the east side. The highest number of eggs found by us in a clutch was 5, but Koenig met with 6 on one occasion, and 7 and even 8 (?) have been recorded. Young in down were first met with on 14 July by us, but Koenig reports recently

hatched young on 10 July. Flightless Brent were associating with Barnacle Geese and many Pink-footed Geese on 17 July, 1921, on a lagoon in the Sassen Valley.

19. *Branta leucopsis* (Bechst.). Barnacle Goose.

Till the date of Koenig's two expeditions in 1907 and 1908 we had no reliable information as to the breeding habits or eggs of this species. In 1907 he found a small colony nesting on "bastions" of rocks projecting from the side of one of the valleys debouching on Advent Bay, and obtained two nests with 5 and 4 eggs respectively, while in 1908 he obtained a third nest with 3 eggs. These remained the only fully authenticated specimens till 1921, when we had the good fortune to obtain no fewer than 5 nests, containing 22 eggs, while others proved to be inaccessible. The nests were generally on moss-grown slopes at the foot of a steep bluff, with another drop of 20 feet or more below, or on outlying spurs of rock projecting over the valley below. There is reason to believe that other nests were placed in even more remarkable sites, as a Goose was seen to leave a hollow in the face of an overhung cliff, and another bird was seen apparently incubating on the top of a mushroom-shaped pinnacle of rock at the summit of a high range of cliffs. We have now good evidence of the breeding of this species, not only in Advent Bay, but also in Sassen Bay, Klaas Billen Bay, and Dickson's Bay, while Ice Fjord appears to be the main breeding-ground of this fine species, though it certainly also breeds in Wijde Bay, and probably in Bell Sound. Evidently the same sites are resorted to year after year (as is also the case with *A. brachyrhynchus*), and in some cases even the same nesting hollow. The ganders of all three species of Spitsbergen-breeding Geese are generally to be found standing on guard by the side of their incubating mates. Measurements of the 22 eggs taken by Mr. A. H. Paget Wilkes and myself, together with Koenig's 12 eggs, give an average of  $76.3 \times 49.8$  mm.; max.  $82.7 \times 46.4$  and  $77.6 \times 52.7$  mm.; min.  $70.6 \times 50$  and  $82.7 \times 46.4$  mm. Two flightless males were shot from a mixed flock of about 60 Geese in Sassen Valley on 17 July, 1921.

**20. *Anas crecca crecca* L. Teal.**

Casual visitor to Bear Island; three shot on 5 August, 1907. In Spitsbergen, Dr. Bunge saw on 16 May, 1900, Ducks in Horn Sound which he ascribed to this species or *A. querquedula*, and Schalow records one killed towards the end of March 1901 in west Spitsbergen.

**21. *Anas penelope* L. Wigeon.**

Not previously recorded from Bear Island. On 18 June, 1921, a flock of nine Ducks flew inland east of Cape Bull and settled on some marshy ground. They rose wild and gave no chance of a shot, but we could plainly see their reddish heads and light grey backs, while they had not the black breast of *Nyroca ferina*. H. L. Powell had seen a Duck at Walrus Harbour two days previously, which was almost certainly the same species. In Spitsbergen, Le Roi records a male on Anser Islands on 8 July, 1907, and on 27 June, 1921, four Ducks were seen by Messrs. Brown and Wilkes at the same place, which must have been Wigeon.

**22. *Anas acuta* L. Pintail.**

Once on Bear Island: a male on 15 July, 1898 (Kolthoff). In Spitsbergen: a male and a female seen in Recherche Bay, 13 June, 1898; two Ducks seen in Van Mijens Bay on 4 July, also probably this species, but not certainly identified (Kolthoff).

**23. *Harelda glacialis* (L.). Long-tailed Duck.**

In Bear Island, though by no means common, it occurs on the larger lagoons and in the flat northern half of the island on the numerous lochs and tarns, and evidently breeds. In Spitsbergen it is sparingly distributed along the western and northern coasts to Wijde Bay and Ross Island. Apparently the nest has only once previously been found in Spitsbergen and once in Bear Island. Two nests were discovered by the Oxford Expedition; one with 8 eggs, neatly hidden in a recess in rock on the Reindeer Peninsula (Liefde Bay) on 7 July, and a second on the open tundra near Cap Boheman, with 6 highly incubated eggs, on 12 July. Several pairs were evidently breeding near Liefde Bay, not



only on the islands, but also on the adjoining mainland, and a pair at Kings Bay.

24. *Oidemia nigra nigra* (L.). Common Scoter.

First recorded from Bear Island in 1907 by Koenig and again in 1908. In June 1921 we met with pairs on the little tarns in the hills and also on the lagoons in the low ground. They had evidently not yet begun to nest, but probably breed in small numbers here and also in the watery northern flats. In Spitsbergen the only definite record is from Recherche Bay, where Koenig found a nest with 6 eggs on 15 July, 1905.

25. *Somateria mollissima borealis* (Brehm). Northern Eider.

Resident on Bear Island, but only in small numbers, absent only when the bays are frozen up in winter. Much commoner in Spitsbergen, breeding in great numbers on the numerous Eider holms, especially Dun Islands, Anser Islands, Edinburgh Islands, Kings Bay, Cloven Cliff, and the islands in Liefde Bay. Also numerous on Moffen Island. Enormous numbers of eggs are systematically taken for food and the down collected for the Norwegian market. Where undisturbed, large clutches were met with, 6 or 7 being normal and 8, 9, and once 10 being met with. A nest with 13 eggs was probably due to two females laying together.

26. *Somateria spectabilis* (L.). King Eider.

Frequently recorded from Bear Island, but chiefly immature birds. No evidence of breeding here. In Spitsbergen the King Eider has been recorded from many points on the west coast and Ice Fjord, but the only evidence of breeding comes from Axel Island (?) (Nordenskiöld), the swamps at the head of Advent Bay where Koenig obtained two incomplete clutches in July 1907, and a holm off the south-west of Prince Charles Foreland, where Dreyer obtained a clutch in 1882. We met with a flock of about 30 males in the Foreland Sound on 30 June, 1921, and single males



were shot on the Edinburgh Isles (29 June) and Dickson Land (26 June), and others seen. Dr. G. J. van Oordt showed us a nest with 5 eggs on the tundra behind Cap Boheman on 12 July, and the same afternoon I flushed a female from another nest with 5 eggs on the open tundra. From notes kindly supplied by Dr. van Oordt it is evident that this Eider breeds in scattered pairs over a vast expanse of open tundra, though apparently occasionally also among the crowded Common Eiders on an Eider holm.

27. *Fulmarus glacialis glacialis* (L.). Fulmar Petrel.

Breeds in vast numbers on the upper part of the sea cliffs round the southern part of Bear Island. Some scores of birds were sitting on their nests on the flat top of Gull Island, South Haven, and the top of a stack near Cape Bull was white with them. It was even more surprising to find them breeding on a big cliff, out of sight of the sea, together with Kittiwakes and Glaucous Gulls. On Spitsbergen it was ubiquitous, patrolling the coast line with tireless flight and breeding in most of the mountain cliffs. Here, too, we found nesting colonies several miles inland up the valleys, and subsequently the exploring party noticed breeding stations on Mt. Terrier up to 3000 feet, and found a small colony at the head of Oxford Glacier, 20 miles from the sea in either direction.

28. *Podiceps griseigena griseigena* (Bodd.). Red-necked Grebe.

Dr. Finsch records one obtained in 1868 on Spitsbergen by the German North Polar Expedition.

29. *Colymbus arcticus* L. Black-throated Diver.

A. H. Cocks mentions having seen a pair of Divers, which he felt sure were Black-throated, near Green Harbour on 9 September, 1882 (Zool. 1883, p. 399; 1884, p. 15); and a Norwegian, Klerk by name, assured him that he had shot one some years previously. On 30 June, 1921, one pitched on the Richard Lagoon, on the north-west of Prince Charles Foreland, and remained there for 20 minutes before

flying off. At times it came quite close to us, and was watched through a powerful stalking glass and field-glasses by Messrs. S. Gordon, D. Brown, H. Paget Wilkes, and myself.

30. *Colymbus immer* Brünn. Great Northern Diver.

Two seen by Nathorst off Bear Island in September 1882. In Spitsbergen it is said to have been seen in September 1882, north of Bell Sound (Zool. 1884, p. 15); by Kolthoff on 8 June, 1900, off the south-west coast, and by W. S. Bruce on Prince Charles Foreland (Geog. Journal, 1908, p. 147). Zedlitz (J. f. O. 1911, p. 300) ascribes a black-throated Diver seen by him 150 yards away at sea in rough weather in 1910 to *C. adamsi*.

31. *Colymbus stellatus* Pontopp. Red-throated Diver.

A few pairs on the tarns in the south of Bear Island, and common in the north. In Spitsbergen it is widely distributed, breeding on most of the fresh-water pools on islands and also on the mainland. The nest is built of masses of *Sphagnum*, and is usually close to the water's edge, though one on the Moffen Island was 20 yards away. In this case the incubating bird shovelled her way to the nest on her breast, without making any attempt to walk. Young on water with parents in Sassen Valley on 17 July.

32. *Charadrius hiaticula hiaticula* L. Ringed Plover.

On Bear Island, Koenig's Expedition obtained three on 18 June, 1907, and on 3 July, 1908, a female with incubation patch. In Spitsbergen it has been recorded on many occasions since 1827 on the west and north coasts, as well as in King Karl Land, but though evidently breeding, no nests have hitherto been found. At Advent Bay three or four pairs were found breeding about 300 ft. up the side of a valley on 21 July, 1921. In one case the bird was watched on to young which had only been hatched six hours or so (S. P. Gordon) \*.

\* *Charadrius morinellus* is said to have been found dead by Keilhau in Edge Land in September 1827, but his identification cannot be depended on.

The only two birds I have been able to examine are both rather short-winged (125–127 mm.).

33. *Charadrius apricarius apricarius* L. Golden Plover.

Not previously recorded either from Bear Island or Spitsbergen. Soon after landing at Walrus Harbour on 13 June, we saw a pair, of which the male was shot, but the female escaped. We saw no more of this species till our last day on Bear Island, when I met with a pair high up in the mist-covered hills near Cape Bull. The male was very anxious and probably was breeding not far away.

34. *Arenaria interpres interpres* (L.). Turnstone.

On Bear Island it has been seen on two occasions: by Kolthoff in 1898 and Duge in 1899. On Spitsbergen, Le Roi mentions about 9 records, and Zedlitz (J. f. O. 1911, p. 323) suggests that some pairs breed in the marsh at the head of Advent Bay. Probably they breed in Ice Fjord, as birds were shot in Dickson Land and Gyps Valley and a pair seen near Cape Wyk on 13 July, 1921. In Liefde Bay and its islands we found Turnstones present in some numbers and breeding. Between 3 July and 7 July, nineteen pairs were located, and in eighteen cases one or other parent watched on to incubated eggs or recently hatched young.

35. *Calidris canutus* (L.). Knot.

Once recorded (♂, 22 August, 1889 on Berentine Island) by A. Walter.

36. *Erolia alpina alpina* (L.). Dunlin.

Previous reliable records of this species are very scanty. Walter saw one on Edge Land and obtained another on King Ludwig Isles in 1889. A wing picked up by Feilden in 1894 at Green Harbour probably belonged to a Dunlin, and on 15 June, 1908, Le Roi shot a female at Advent Bay. In 1921 two were seen and one female shot on the Edinburgh (Foreland) Isles on 29 June, and H. L. Powell saw three others. In Sassen Valley on 17 July about five pairs were met with; the males were flying anxiously round and

trilling, but no occupied nest was found in the limited time available, though the birds were evidently breeding. One male was shot. Dr. Van Oordt also saw one near Cap Boheman on 25 June. Our two Spitsbergen specimens (and others seen) have less black on the breast than Norwegian birds.

37. *Erolia maritima maritima* (Brünn.). Purple Sandpiper.

Widely distributed, and may be met with almost everywhere where the ground is free from snow, both on Bear Island and Spitsbergen, breeding on the hillsides as well as the low ground. Full clutches were taken on Bear Island from 16 June onward. The incubation period according to Dr. Van Oordt's observations lasts about 21 days.

38. *Crocethia alba* (Pall.). Sanderling.

Absent from Bear Island and only recorded on four occasions prior to 1907, when W. S. Bruce obtained young in down on Prince Charles Foreland, and thus proved that occasionally at any rate it breeds in the group. In 1908 over twenty were observed by Koenig's party on six separate occasions between 15 and 26 June, and fourteen specimens obtained. We first met with it in Liefde Bay on 3 July, 1921, when two males were shot and two other birds seen on Reindeer Peninsula. On 6 July one was seen on the Iles de Canards, and two were watched for some time on the mainland on 7 July.

39. *Phalaropus fulicarius jourdaini* Irçdale. Grey Phalarope.

Koenig met with several pairs on the north coast of Bear Island, evidently breeding, on 13-14 July, 1907. In Spitsbergen it occurs locally at many points on the west coast and in Ice Fjord. On the north coast we found it breeding on the islands in Liefde Bay, as well as on the mainland, in the neighbourhood of marshy pools. Nests were also met with by us on the Edinburgh Isles, the Anser Islands, and the tundra near Cap Boheman in Ice Fjord. It has also

been found on the east side, and breeds on King Ludwig Isles (Koenig) and King Charles Land.

This form was separated by Iredale (Bull. B. O. C. xlii. 1921, p. 8) from the typical race, described from Hudson Bay, on account of the decidedly paler coloration of the edgings of the feathers of the back, scapulars, and tertials, which are warm cinnamon in the American bird and pale creamy in Spitsbergen specimens. This is most apparent in the females. Meinertzhagen has attempted to show that this difference is due to bleaching, and unfortunately at the time we had no European May-killed specimens to compare with those shot on the American sea-board at this time; but specimens recently received, shot at Hudson Bay, in July show the characters of the American race and are readily distinguishable from Spitsbergen birds killed at the same time, while a bird from Devonshire (14 May, 1908) is very noticeably paler than the American birds.

40. *Phalaropus lobatus* (L.). Red-necked Phalarope.

Only three records: a male on 23 June, 1900, at Coal Bay (Kolthoff) and a pair in the delta of Advent River, 29-30 June, 1907 (Koenig). The latter were apparently breeding.

41. *Numenius phaeopus* (L.). Whimbrel.

A dead bird recorded from Bear Island in June 1898 (Römer & Schaudinn). In Spitsbergen a dead specimen was picked up in Bell Sound in 1881; another was obtained by a Norwegian ship in 1891 and is now in Tromsø Museum; while a third was seen near Amsterdam Island on 4 July, 1900 (Kolthoff). Dr. Van Oordt saw one at Cap Boheman on 26 June, 1921.

42. *Scolopax rusticola* L. Woodcock.

Koenig records remains of a Woodcock at a fox-earth in Sassen Bay in 1907.

43. *Sterna paradisæa* Brünn. Arctic Tern.

Breeds commonly on the north and north-east coasts of Bear Island and more sparingly on the north-west. On



Spitsbergen it is common, breeding in colonies on many of the islands, even in the extreme north. It also nests on shingle-banks and spits on the mainland in one or two places. We found it plentiful on Mofsen Island on 8 July. At Liefde Bay specimens were observed and shot on the breeding-ground early in July, still retaining more or less white on the forehead and with black beak and blackish-red feet. In the great majority of cases the clutch consisted of two eggs only, but we met with a few instances in which three had been laid.

44. *Xema sabini* (Sabine). Sabine's Gull.

Nansen saw one at 83° N. off Spitsbergen in July 1896, and Römer and Schaudinn on 8 August, 1898, found about eight pairs apparently breeding on Stor-Oën, east of North-East Land. Koenig's expedition obtained a pair of birds and two eggs on a flat island in Kings Bay on 6-7 July, 1907, and W. S. Bruce also recorded one bird in the same year from Prince Charles Foreland. In 1908 one was shot by Koenig off the Foreland on 19 June and another seen in Sassen Bay on 22 June. J. S. Huxley reports a small gull, seen at close range on 7 July, 1921, near Richard Lagoon, Prince Charles Foreland, which may have been an immature bird of this species.

[*Rhodostethia rosea* (MacGill.). Ross' Gull.

Reported as seen north of Spitsbergen by Ross and in Torell's work from the Hinlopen Straits, but probably due to mistaken identification.]

45. *Larus argentatus argentatus* Pontopp. Herring-Gull.

One obtained 1 July, 1908, near Walrus Harbour by Koenig's Expedition, the only record.

46. *Larus marinus* L. Great Black-backed Gull.

Near Bear Island, Koenig saw one on 11 June, 1908. In 1921 we met with two pairs evidently breeding on skerries north of Walrus Harbour, and on 19 July, Longstaff and Powell took the boat out to the nearer rock and obtained

the breeding pair as well as two large young in down and an addled egg.

Pike's record of immature birds in September 1888 at Smeerenberg Bay probably refers to young *L. hyperboreus*.

47. *Larus hyperboreus* Gunn. Glaucous Gull.

On Bear Island breeds in considerable numbers above the colonies of Guillemots and Fulmars all round the southern part of the island, practically all the birds seen being in fully adult plumage. The breeding-season is curiously variable, but in each colony the birds apparently nest at approximately the same time, so that while most of the eggs in one part of the cliffs are almost hatching, those in another colony, less than a mile distant, may be nearly fresh. Koenig also reports nests on the east side of the island at the foot of the cliffs, not far above high-water mark. On Spitsbergen, though widely distributed, this species is less plentiful and nests at times on the Eider holms and pinnacles of rock or along ledges near the top of cliffs. Out of about 150 nests examined none contained more than three eggs, but clutches of four have been recorded by Römer & Schaudinn, Koenig, and Nordenskiöld.

48. *Bissa tridactyla tridactyla* (L.). Kittiwake.

On Bear Island breeds in large numbers in colonies on the sea cliffs, in close companionship with the Guillemots. Great flocks may be met with inland, bathing in the fresh-water lagoons and collecting moss for their nests. It was, however, surprising to find a large colony nesting on a high range of cliffs together with Fulmars and apparently also Glaucous Gulls, quite out of sight of the sea, on 17 June, 1921. No nests examined on Bear Island contained more than two eggs. In Spitsbergen many colonies exist on cliffs, generally in company with other rock-breeding species.

49. *Pagophila eburnea* (Phipps). Ivory Gull.

Only once noted on the drift-ice near Bear Island, on 11 June, 1908 (Koenig). On Spitsbergen the only reliable

breeding records are those from the Stor-Oën, off the east coast of North-east Land, where large numbers were found nesting in August 1887 : on White Island (Giles Land), also apparently a large colony ; and Abel Island. Smaller colonies have also been reported from Jena Island, Cape Hammerfest, Cape Weissenfels (Swedish Foreland), and King Charles Land. Malmgren reported a colony in July 1861 in Murchison Bay, apparently since deserted, and Eaton speaks of nests (not examined) at Wijde Bay and Cape Oetker. As this species depends to a great extent for its food on the presence of ice, its breeding-grounds will always be difficult to reach till late in the season, and the presence of occasional birds with incubation patches in the height of the nesting season is no proof of breeding in that district. Our exploring party met with one bird flying up the Oxford Glacier, on 16 August, about 20 miles from the sea in either direction, and another was seen two days later. Evidently they fly across from the east side (Stor Fjord and Olga Strait) to the west side (Bell Sound, Ice Fjord, Red Bay, Liefde Bay, etc.).

50. *Stercorarius skua skua* (Brünn.). Great Skua.

One obtained in 1898, now in Göttingen University Museum. Römer and Schaudinn report a pair seen on Swedish Foreland in 1898, and Koenig's expedition observed single birds in Van Keulen Bay (23 June, 1907) and Kings Bay (26 June).

51. *Stercorarius pomarinus* (Temm.). Pomatorhine Skua.

Recorded from Bear Island and its neighbourhood on several occasions, but there is no proof of breeding there. On Spitsbergen it has occurred irregularly, occasionally in considerable numbers, as in August 1889 when Waite met with flocks of 5 to 15 off Barents Land. Possibly it may breed, but at present we have no direct evidence. Huxley records a pair of Skuas, apparently of this species, seen on 8 July in Foreland Sound.

52. *Stercorarius parasiticus* (L.). Arctic Skua.

Breeds commonly in the valleys on Bear Island, the light-breasted form greatly predominating. On Spitsbergen it is somewhat local, but in some districts common, as at the north end of Prince Charles Foreland. None of the birds met with on Møffen Island appeared to be nesting there, but on the islands in Liefde Bay this Skua was breeding and fairly common. Two clutches taken on Bear Island on 17 June must have been incubated for ten days or so.

53. *Stercorarius longicaudus* Vieill. Long-tailed Skua.

Occasionally observed on Bear Island, where Koenig obtained a juvenile female apparently of this species. On Spitsbergen it is not rare, though far less numerous than the Arctic Skua. In Advent Bay it seems to be particularly common. Here Koenig collected 10 specimens on 17 July, 1907, and we saw several on 18 July, 1921. With regard to its breeding, there is still much uncertainty, and the statement in 'The Ibis,' 1897, p. 595, cannot be accepted without reserve. At Liefde Bay a pair showed some signs of attachment to a particular locality, and a young bird of the previous year was obtained on 4 July, 1921, but a pair at Bruce City showed no signs of nesting up to the end of July, and then disappeared.

54. *Alca torda* L. Razorbill.

A few probably breed in the great bird colonies at the south side of Bear Island, where they have been seen on several occasions, and Koenig obtained a male on 30 June, 1908. On Spitsbergen it has been definitely recorded by Bruce from Prince Charles Foreland.

55. *Uria troille troille* (L.) and var. *ringvia* Brünn. Common Guillemot.

On the cliffs from Gull Island and South Harbour to Needle Rocks (Bear Island) vast numbers of Guillemots breed. Of these, *U. lomvia lomvia* is the more numerous, but the ringed variety of the Common Guillemot is not uncommon, and is much more numerous than the typical form. In some

cases all three may be found on the same ledge, crowded together, and rendering the authentication of the eggs somewhat difficult, but there is a distinct tendency for the ringed birds to associate in little groups among the far more numerous Brünnich's Guillemot. Nearer Cape Bull, Paget Wilkes met with a colony of Common Guillemots breeding on the flat top of a stack in great numbers, while Brünnich's Guillemots were breeding on the flanks of the colony. The eggs in this isolated colony were much further advanced in incubation than others from the cliffs farther east. From Spitsbergen the only positive record is that of one obtained in August 1898 on Barents Island by the Prince of Monaco, though possibly one was shot by Herr Dreyer in 1881.

56. *Uria lomvia lomvia* (L.). Brünnich's Guillemot.

Breeds in enormous numbers on the cliffs of the south coast of Bear Island as already mentioned. In Spitsbergen there are also many large colonies, but it is very questionable whether it is, as stated by Koenig and Le Roi, the commonest kind there excepting the Little Auk, as the Fulmar is much more generally distributed and breeds inland as well as on the coast.

57. *Uria grylle mandtii* Mandt. Mandt's Guillemot.

Small colonies of breeding birds scattered along the cliffs of the southern part of Bear Island, where a bird was found sitting on two eggs on 16 June, 1921. In Spitsbergen it is widely distributed, ranging north even to Ross Island and Charles XII Island, and it is not uncommon to find several pairs breeding in cliffs a mile or two distant from the sea.

58. *Plutus alle* (L.). Little Auk.

Breeds in small colonies at many points round the southern coast of Bear Island, but not in great numbers. Here we obtained fresh eggs on 16 June, 1921. In Spitsbergen it is much more numerous and is probably the commonest bird, though not nearly so general as the Fulmar. Some colonies, as for example those at Advent Bay and Magdalena Bay, are of enormous extent, and the breeding-range extends north



to Ross Island and east to the Ryk Ys Islands. Both sexes take part in incubation and are very reluctant to leave the egg.

59. *Fratercula arctica arctica* L. Norwegian Puffin.

The researches of Koenig and Le Roi have shown that the Bear Island Puffin belongs to a smaller billed and shorter winged race than the Spitsbergen form, apparently identical with that breeding on the coast of Norway. It is not numerous, but a few pairs nest in the cliffs from Mount Misery southward and also on the north side near Herwig Harbour. Koenig obtained a single male of this form at Van Keulen Bay on 14 June, 1908, and among those shot by our party at Vogel Hoek, Prince Charles Foreland, was another small-billed and short-winged bird (1 July, 1921).

60. *Fratercula arctica naumanni* (Norton). Spitsbergen Puffin.

Not very numerous, but breeds in the cliffs at many points along the west and north-west coast, and only occurs occasionally on the east side. No eggs of this race appear to have been previously taken in Spitsbergen, and the breeding habits seem to differ somewhat from those of its southern relative, for no attempt is made as a rule to burrow into the ground, the single egg being laid in a cleft or recess in the face of a cliff, between masses of rock. It is also a late breeder, for eggs taken at Cloven Cliff on 9 July, and one from Anser Island on 17 July, were only slightly incubated.

61. *Lagopus mutus hyperboreus* Sund. Spitsbergen Ptarmigan.

Of the distribution and status of this species there is still much to be learned. Most notices of its appearance are from the west coast, but it has been recorded from North-East Land, Barents Island, Edge Island, etc. Apparently in 1920 it was present in considerable numbers at Ebba Valley (Klaas Billen Bay), and large numbers were shot there in that year; but though feathers and droppings were to be seen in hundreds along the sides of the valley, and in one case the

remains of a nest with fragments of shells was discovered, we saw no sign of a living bird. The stupid tameness of this species threatens its extermination, unless it is able to retain a footing on the east side. Possibly the open winter of 1920-21 with the comparative absence of snow, induced the birds to leave their old haunts and migrate to fresh fields, unless, indeed, it has been locally exterminated.

### IX.—*Species and Subspecies*.

By PERCY R. LOWE, M.B.O.U.

ONE of the chief reasons which induced me, in collaboration with Mr. Mackworth-Praed (*Ibis*, 1921, pp. 344-347), to chase the hare started by Mr. Loomis in the pages of 'The Ibis' (1920, pp. 964-966) on the subject of subspecies, was to call attention to the opinion held by us, that ornithologists in general did not apparently sufficiently distinguish between mutational or discontinuous variations which characterised one form of subspecies and continuous or environmental variations which characterised another form.

If I may venture, in flat defiance of the example of the angels, to plunge once more into the discussion, I would like to give one or two concrete examples by way of illustrating what are my own personal views on the matter.

A. As examples of discontinuous or mutational subspecies I may quote the following, taken at random:—

- (1) *Pluvialis apricarius oreophilus* Meinertz, which has just recently been described (*Bull. B. O. C.* vol. xlii. 1921, p. 6).
- (2) *Podiceps cristatus infuscatus* Salvad.
- (3) *Querquedula discors albinucha* Kennard, *Auk*, xxxvi. 1919, pp. 459-460.

Examining these in detail and confining myself to a single differential character in each, we find that:—

In *Pluvialis a. oreophilus* the narrow but well-defined black frontal band present in *P. a. apricarius* is absent in the British breeding race (*cf.* *Bull. B. O. C. loc. cit.*).